Northern Spotted Owl Survey Data Analysis

US Fish and Wildlife Service
February 27, 2008

During the US Fish and Wildlife Service-Cal Fire Timber Harvest Plan Technical Assistance Workshop on 2/13/08, questions from Cal Fire staff arose regarding how to analyze survey data for adequacy with respect to determining whether or not incidental take of northern spotted owls (NSO) is likely. The following is a description of what the US Fish and Wildlife Service looks for when reviewing survey data under the technical assistance process. Page numbers in parentheses refer to the corresponding pages in the 1992 NSO survey protocol.

NSO Survey Forms vs. NSO Survey Summary Sheet

- **NSO Survey Forms** capture data from an individual survey.
    - NSO Survey Forms provided detailed information about each survey including the survey date, start and end times at each survey station, duration of time spent at each survey station, NSO response information if heard, weather conditions, and general notes.
- **NSO Survey Summary Sheets** summarize the surveys conducted for a given area.
    - NSO Survey Summary Sheets provided basic information about each survey visit including survey date, start and end time for survey route, NSO response information if heard, and general notes.

Number of surveys per year

- Under a one year survey protocol, six surveys of the entire survey route are conducted in one year (page 2).
    - Example: Six surveys conducted in 2007
- Under a two year survey protocol, three surveys of the entire survey route are conducted in each of the two years (page 2).
    - Example: Three surveys conducted in 2006 and three surveys conducted in 2007.

Placement of Survey Stations

- Survey stations should be set up such that all suitable habitat within 0.7 mile of harvest units is covered.
- Survey stations should be spaced ¼ to ½ mile apart depending upon topographic features and condition of habitat
    - Topographic features such as ridges will reduce the distance that a survey station covers

Weather Conditions

- Surveys should NOT be conducted under inclement weather (wind >10 mph, loud stream noise, moderate to heavy rain or snow fall) (page 7).

- Ability to hear responses is impaired under inclement weather.

Survey Dates

- Surveys take place between March 15 and August 31 (page 5).
    - NSO detections heard after August 31 maybe valid, but the value of the detection is diminished because NSOs are typically away from the nest stand at this time of year.
    - Negative surveys after August 31 cannot be counted toward annual survey effort.
- Surveys should be spread over 2-3 months rather than lumped early or late in survey period (page 8).
- Surveys must be spaced **at least** five days apart (page 8); more days between visits recommend for adequate evaluation of presence/absence of NSO.
    - Example: A survey is conducted on May 3; the soonest the next survey can occur is May 9. May 4, 5, 6, 7, and 8 are the five days that must be skipped.
- For a two year survey protocol, a minimum of two night visits must be conducted before June 30; one of the two visits should be conducted in June (page 8).
- For a one year survey protocol, a minimum of four night visits must be conducted before June 30; one of the four visits should be conducted in June (page 8).
- Examples of survey dates that do not meet the intent of protocol
    - All visits conducted in one month
    - Two visits in March and one in late August

Route Access Delays and Safety Concerns

- High snow years, blocked roads, and landslides can hinder access to survey routes (page 8)
    - Surveyor should contact agency reviewing surveys to inform them of late survey dates and make notes on survey forms and/or summaries.
    - Depending upon when access is gained, additional surveys and/or stand searches may be suggested to determine presence/absence of NSOs
- Due to concerns for safety, daylight surveys may be used when conditions do not allow for safe night surveys (e.g., blocked road that can be hiked or roadless areas) (page 8).
    - If multiple daylight surveys are conducted in lieu of night surveys, survey effort may not be sufficient to determine presence/absence of NSO.

Survey Times

- Night surveys must be conducted between sunrise and sunset (page 7).
    - Sunset/Sunrise Table by city and year can be found at: http://aa.usno.navy.mil/data/docs/RS_OneYear.php
    - Be sure to adjust for Daylight Savings Time
        - DST dates from 1990-2015 can be found at: http://www.energy.ca.gov/daylightsaving.html

- The duration of time spent at each survey station should be a minimum of 10 minutes (pages 6-7)
    - If NSO responds, not necessary to stay for full 10 minutes

NSO Responses (pages 8-10)

- Typical male response is a 4-note hoot
- Female will give 4-note hoot also, but may also "bark" or "monkey call"
- Male hoots are lower-pitch while female hoots are higher-pitch
- Young have a raspy call
- When NSOs are detected during night surveys the time, compass bearing, type (male/female, 4-note, bark, monkey call), and approximate distance must be recorded on survey form.
    - Approximate location or response must be mapped on route map
        - At a minimum the map should show contour lines, survey station locations, a location of response
- Adjacent survey stations may be skipped if it is determined that they would likely pick up the same NSO
    - Topography can be used to determine which, if any, survey stations should be skipped
- NSO response locations should be triangulated at night by obtaining additional responses from the response location from other survey stations, without causing undue harassment to NSOs.
    - Triangulated response location will be used as the primary search area during the daytime follow up visit.

Follow up Visit

- If NSO are detected during a night visit, a follow up visit to determine pair and/or reproductive status should be conducted (page 9)
- Follow up visits are a search of the best habitat located within approximately .5 miles of the detection location. During a follow up visit, surveyors search for NSOs as well any indication that NSOs are present (feathers, whitewash, pellets).
- Follow up visits should be conducted during early morning or late afternoon on the day immediately following the response; if follow up is more than a day later, documentation should be provided explaining the delay in the follow up visit.
- Follow up visit data should contain a form that describes the time, location, and results of the visit; If NSO were moused, information should be provided on the form. In addition to the written description of the follow up visit, a map must be provided with the route searched and any NSO detections (visual and aural).
    - The purpose of the map is to verify that the location searched corresponds to the location of the response from the night survey.
    - Follow ups conducted from roads are not sufficient.
- Refer to pages 11-15 of the NSO survey protocol for information on determining pair and nesting status.

Additional visits

- If NSO are heard during night visit or daytime follow up, but not visually located additional night surveys are necessary.
    - Refer to page 10 of the NSO survey protocol for the number of additional survey needed to meet protocol.

Non-NSO Responses

- Responses (visual and aural) from great horned owls, barred owls, and northern goshawks should be noted on survey and follow up forms.
    - The presence of these species may inhibit NSO response to surveyor calls, as they can predate on NSOs.
    - If great horned owls, barred owls, or northern goshawks respond, calling by surveyor should stop while the surveyor listens for remainder of 10 minutes.

Common Issues with Survey Effort (Red Flags)

- Survey stations do not cover all suitable habitat within 0.7 mile of harvest unit(s).
- If more than one surveyor, surveyors should not be able to hear each other
    - May lead to false negatives: "heard surveyor from adjacent survey station" when it was actually a response from NSO
    - Can check whether or not adjacent survey stations were surveyed at the same time by looking at route map topography and time each station surveyed.
- Surveys less than 5 days apart, especially with one year six visit protocol
- Surveys not spread over 2-3 months
- Surveys start before sunset
- Follow up visits not adequate with respect to duration of survey and/or area searched
    - Area searched not consistent with night response location
    - Follow up conducted from road as opposed to hiking into response location
    - Follow up conducted in the middle of the day (ideally follow ups should occur in early morning or late afternoon)
    - Duration of follow up too short to adequately cover response area and suitable habitat adjacent to response area
- Additional visit(s) not conducted when NSOs are heard at night, but not located on follow up visit.
- Determinations made with regard to pair or nesting status based on too little information